LAPITSKIY, A.V.; GELETSEANU, I.; BERAN, M. Complex formation of thorium with some hydrogerboxylic acids. Radiokhimiia 4 no.6:672-677 62. (MIRA (Thorium compounds) (Acids, Organic) (Ion exch (MIRA 16:1)

(Ion exchange)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R000514620007-6"

GELETSEANU, I.; LAPITSKIY, A.V.

Study of thorium complex formation by methods of ion exchange, infrared spectroscopy, and nuclear magnetic resonance. Dokl.AN SSSR 144 no.3:573-575 My 162. (MIRA 15:5)

1. Moskovskiy gosudarstvennyy universitet im. M.V.Lomonosova. Predstavleno akademikom S.I.Vol'fkovichem.

(Thorium compounds)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R000514620007-6"

s/186/63/005/002/004/005 E075/E136

AUTHORS:

Lapitskiy, A.V., Geletseanu, I., and Mink, Ya.

TITLE:

Investigation of the complex formation of thorium

with mandelic and a-oxyisobutyric acids

PERIODICAL: Radiokhimiya, v.5, no.2, 1963, 249-258

The complexing with the acids was examined with a view to their utilization as eluants in the purification of Th by ion-exchange methods. To this end the adsorption of 234Th was studied on cation exchanger resin Dowex 50 and 5 in the Na form. The work was carried out at the pH's of 1.75 to 2.5 to minimize the adsorption of Th on glass and because at this pH range the distribution coefficients were sufficiently large. The instability constants were calculated at pH = 2.2 by two methods, of which the method of S. Froneus (Acta Chi., Scand., v.4, no.1, 1950, 72) was considered the more reliable. The first instability constants for mandelic and α -isobutyric acid were 1.82 x 10-3 and 3.83 x 10-5 respectively. The second constants were 0.67 x 10-5 and 2.44×10^{-6} , and the third constants 1.92 x 10⁻⁷ and 8.34 x 10⁻⁹ respectively. Changes in the concentration of mandelic acid from والموارا والمرافقة والراوي موجود والمراوي المستهور والرواق والموجوع والمحاصر والمراوي Card 1/2

Investigation of the complex ...

S/186/63/005/002/004/005 E075/E136

0.01 to 0.1 M decrease the distribution coefficient by two orders of magnitude and a similar trend is shown for α -oxyisobutyric acid. The first complex [Th A] 3+ forms at the concentration of addend of 2 x 10^{-3} M. During further increases of the concentration up to about 10^{-2} M the composition of the complex changes to $[Th A_2]^{2+}$, $[Th A_3]^+$ and $[Th A_{3.5}]^{0.5+}$. In general,

α-oxyisobutyric acid forms more stable complexes than mandelic acid and therefore is a more suitable eluent for the isolation of Th by ion exchange methods. There are 13 figures and 7 tables.

SUBMITTED: January 18, 1962

Card 2/2

LAPITSKIY, A.V.; GELETSEANU, I.

Study of protactinium complex formation with mono-, di-, and polycarboxylic acids by the ion exchange method. Part 2: Complex formation of protactinium with &-hydroxybutyric and amygdalic acids. Radiokhimiia 5 no.3:330-334 63. (MIRA 16:10)

(Protactinium compounds) (Acids, Organic)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R000514620007-6"

生物的复数 经联系

S/020/63/149/003/023/028 B117/B186

AUTHORS:

Moskvin, A. I., Geletseanu, I., Lapitskiy, A. V.

TITLE:

Some regularities of complexing of pentavalent actinides

PERIODICAL:

Akademiya nauk SSSR. Doklady, v. 149, no. 3, 1963, 611-614

TEXT: On the basis of compositions and instability constants of complexes of pentavalent Pa, Np and Pu with anions of some acids (determined by means of the ion exchange method), the tendency of these elements to form complexes was shown to be much stronger than is generally supposed. This tendency is much the same for the elements mentioned, as they form complexes of identical composition and approximately identical stability with anions of suitable acids. The tendency of the addends to form complexes decreases according to the following sequence:

 $\gamma^{4-}>$ Cit³⁻ > HPO $_4^{2-}>$ tart²⁻>Ac⁻ \simeq Lact⁻. The stability of the complexes of Pa(V) with hydroxy acids permits generalization of this sequence as follows: EDTA > citric acid > oxalic-> phosphoric-> trioxyglutaric > α - card 1/2

Some regularities of ...

S/020/63/149/003/023/028 B117/B186

Although no complete data exist for Np(V) and Pu(V), this sequence can also be applied for these elements owing to conformance of instability constants. Instability constants of complexes formed by Pu of different valence with the same addend show that Pu in the pentavalent state has the weakest tendency to form complexes. On the basis of the similarity of complexing properties of pentavalent Pa, Np and Fu, and of the quantitative data available, conclusions may also be drawn as to the composition and stability of complexes of pentavalent uranium with the acids mentioned. One of the properties of actinides which serves to prove their position in the periodic system of elements is their behavior during ion exchange. Pa, Np and Pu in pentavalent state were found to behave similarly during ion exchange. There are 1 figure and 1 table.

ASSOCIATION:

Moskovskiy gosudarstvennyy universitet im. M. V.

Lomonosova (Moscow State University imeni M. V. Lomonosov)

PRESENTED:

October 29, 1962, by I. I. Chernyayev, Academician

SUBMITTED:

October 24, 1962

Card 2/2

GELETSEANU, I.; LAPITSKIY, A.V.; VEYNER, M.; SALIMOV, M.A.;
ARTAMONOVA, Ye.P.

Thorium acetates. Radiokhimiia 6 no. 1:93-101 '64. (MIRA 17:6)

GELETSEANU, I.; LAPITSKIY, A.V. [deceased] Complex formations of actinide elements. Radiokhimiia 7 no.3:280-283

ACC NR. AP5028366 EWT (m)/EWA(d)/EWP(1)/T WW/DJ/RM SOURCE CODE: UR/0369/65/001/005/0527/0539	
ACC NR. AP5028366 SOURCE CODE: UR/0369/65/001/005/0527/0530	
Hornott. Colomby B.A.; Geletukna, G.N.	
ORG: <u>Kiev Institute of Civil Aviation Engineers</u> (Kiyevskiy institut inzhenerov grazhdanskoy aviatsii)	
TITLE: Mechanical-chemical dispersion of metals in dynamic contact with polymers	
SOURCE: Fiziko-khimicheskaya mekhanika materialov, v. 1, no. 5, 1965, 527-530	
TOPIC TAGS: mechanical failure, metal property, polymer, polymer physical chemistry	
ABSTRACT: The authors discuss some of the results obtained earlier on the mechanical-chemical processes in the metal-polymer contact region. Under laboratory conditions, the working surfaces of textolite samples showed microscopic particles of a metal with a considerably greater hardness than that of the metal of the roller in contact with the samples. An analysis of other data, as well as the results of earlier experiments on the dispersion of metal powders in contact with polymers, led the authors to the assumption that the surface layers of polymers are conducive to the strengthening and brittle fracture of the metal surfaces which are in dynamic contact. In this connection, the authors conducted investigations to determine the role of the polymer in the process of dispersion of the surface layers of the metal. Comparative tests were made on the dispersion of iron in a ball mill with a polymer (emulsion polyethylene, 5% by wt.) and without a polymer. The experimental data show that, in the process of mechanical load the polymer particles are chemically activated and	
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interact with the exposed crystal surfaces of the metal, which causes the intensive dispersion of the metal. Apparently, the chemical activation of the polymer is due to the mechanical destruction of its macromolecules and the formation of free radicals during this process. Other experiments showed that polymers, at the instant of their destruction, have a considerably higher capability for affecting the dispersion of metals than surface-active substances, 1t is established, therefore, that a high-molecular substance at the instant of mechanical cracking is capable of activating the process of deformation and the destruction of a metal. The practical observation of wear of the working surfaces of metal parts working in contact with plastics testifies to the mechanical cracking of macromolecules of the polymer. Orig. art. has: 5 figures.

SUB CODE: 11 / SUBM DATE: 24Apr65 / ORIG REF: 009 / OTH REF: 002

GOROKHOVSKIY, G.A.; GELETUKHA, G.N.

Mechanical and chemical dispersion of metals in dynamic contact with polymers. Fiz.-khim. mekh. mat. 1 no.5:527-530 '65. (MIRA 19:1) 1. Kiyevskiy institut inzhenerov grazhdanskoy aviatsii. Submitted April 24, 1965.

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R000514620007-6"

"APPROVED FOR RELEASE: 08/23/2000

CIA-RDP86-00513R000514620007-6

EWT(m)/EWA(d)/EPF(c)/EPR/EWP(j)/T/EWP(t)/EWP(z)/EWP(b)l 61517<u>-65</u> JD/RM/WW/DJ Pr-1/P5-4 UR/0369/65/001/002/0231/0236 ACCESSION NR: AP5012658 Gorokhovskiy, G. A.; Geletukha, G. Ye.; Kravchenko, V. G. AUTHOR: TITIE: Effective use of antifriction materials with high molecular weight and accompanying phenomena SOURCE: Fiziko-khimicheskaya mekhanika materialov, v. 1, no. 2, 1965, 231-236 TOPIC TACS: polymer, metallopolymer material, antifriction material ABSTRACT: The authors discuss fields where antifriction materials may be used and explain the processes which accompany operations using polymers as antifriction materials. The most efficient use of polymers may be in friction assemblies which operate without radiant heat transmission and without seizing of the bearings. Antifriction materials of metallopolymeric composition have recently come into use. These consist of a porous metal base filled with a polyment The action of polymen protectors must depend on the chemical composition and molecular structure of the polymer. The capacity of high molecular materials to form counterbodies of antiscratching film with slight resistance to shearing makes them useful in machines operating in non-acid media. Metallopolymers do not operate successfully when there Card 1/2

ACCESSION NR	: AP5012658	in the	lubricant.	orig. art. has:	4 figures,	1 table.	
ASSOCIATION:	KIGA, Klev					00	
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TROPCHEVA, Iia, inzh.; CHAUSHEVA, Elka; GELEV, B.; MACHEVA, S.

Modern organization of the production of men's woolen clothes.
Tekstilna prom 12 no. 6:4-8 '63.

1. Nauchni sutrudnitsi pri Nauchnoizsledovatelskiia institut
po tekstilna promishlenost, Sofiia.

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R000514620007-6"

LAZAREV, Nikolay Valentinovich; AYZEN, A.M., inzh., retsensent;

GELEY, G.N., retsenzent; NIKLTOROVA, R.A., inzh., red.;

"GORNOSTAYPOL'SKAYA, M.S., tekim. red.

[Tables of dimensions for designing the profile of spreaket—wheel teeth; handbook Tablitsy razmerov dlia postroentia profilia zub'ev zvezdochek; spravochnik. Moskva, Mashgiz, 1962.

(MIRA 15:7)

(Chains—Tables, calculations, etc.)

GELEV, Georgiy Naumovich; AYZEN, Arkadiy Markovich; KARPOVTSEV, Artem Nikolayevich; VASILENKO, A.A., doktor tekhn.nauk, retsenzent; NIKIFOROVA, R.A., inzh., red.; GORNOSTAYFOL'SKAYA, M.S., tekhn. red.

[Handbook for designing chain transmissions] Spravochnik poraschetu tsepnykh peredach. Moskva, Mashgiz, 1962. 171 p.
(MIRA 15:6)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R000514620007-6"

GELEV, I. and GENOV, I.

"A case of hog cholera."

Veterinariya, Vol. 37, No. 10, 1960, p. 39

Bulgaur.

GELEV, I.; GENOV, I.

A case of hog cholera. Veterinarila 37 no.10:39-40 0 '60.
(MIRA 15:4)

1. Rayonnaya veterinarnaya stantsiya, Ruse, Bolgariya.
(Bulgaria--Hog cholera)

GELEVERI, V.I.; POLUYERTOVA, I.A.; SHOSTAK, I.P.

Investigating drawing conditions and properties of wire made of oxygen-blasted converter steel. Biul. TSNIICHM no. 10:46-48 158.

1. Mishnedneprovskiy savod metallicheskikh izdeliy. (Wire drawing)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R000514620007-6"

GELEVERYA, I., kapitan 3-go ranga

Son of the regiment. Voen. vest. 41 no.3:63-66 Mr '62.

(Radar, Military)

(Radar, Military)

GELEVERYA, I., podpolkovnik; KOLINICHENKO, A., kapitan

Instructor of the political section of a unit. Komm. Vooruzh.

(MIRA 16:5)
Sil 3 no.8:60-65 Ap '63.
(Russia-Armed forces-Political activity)

CELIFAH, Ye.M. (Kalushskaya oblast')

Conducting practical lessons in geometry in the classroom and on location, Mat.v shkole no.3:45-48 My-Je '55. (MIRA 8:7)

(Geometry--Problems, exercises, etc.)

"APPROVED FOR RELEASE: 08/23/2000

Card 1/2

CIA-RDP86-00513R000514620007-6

L 10972-66 EWT(1)/EWA(1)/EWA(b)-2 SOJURCE CODE: UR/0016/65/000/009/0096/0100 ACC NR AP5028398 Gel'fand, A.S.4 AUTHOR: Arkhangel'skaya, lirkutskiy institut epidemiologii i ORG: Irkutsk Institute of Epidemiology and Microbiology mikrobiologii) TITLE: Epidemiological characteristics of the focus of tick-borne encephalitis in the sayan area (Irkutsk Oblast') SOURCE: Zhurnal mikrobiologii, epidemiologii i immunobiologii, no. 9, 1965, 96-100 TOPIC TAGS: encephalitis, infective disease, disease incidence ABSTRACT: The authors carried out epidemiological investigations during 1959-1962 in the steppe, forest-steppe, and taiga areas of the Cheremkhovsk region of Eastern Sayan. These investigations revealed that the degree of contact of the population of these various areas with the natural focus of tick-borne encephalitis is intimately associated with the character of its economic activity and living conditions. It is suggested that for the population of villages involved in the lumber industry the living conditions lay at the base of this contact with the focus, whereas for the population of villages involved in the wood-products industry, the industrial factor played the major role. The authors deem it expedient to differentiate the system of prophylactic measures for the populations involved in the different industries: for the wood-products workers the measures should include vaccination and the creation of tickfree zones around the populated points and for the forestry workers measures should be taken

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R000514620007-6"

UDC: 616,988,25-022,395-036,2 (571.53)

L 10972-66 ACC NR: AP50283 to eradicate the tic	cks at places most frequent	y visited by the inhabitants for ne immunological indices (by the ces of the intensity of the natura	household e complement-
fixation test) and to of ticks, number o	fticks carrying viruses) for	various years. Orig. art. ha	s: 2 tables.
SUB CODE: 06 /	SUBM DATE: 04Mar64 /	V	·
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Card 2/2			

ARKHANGEL'SKAYA, M.V.; GEL'FAND, A.S.

Epidemiological characteristics of a focus of tick-borne encephalitis in the Sayan Mountain region (Irkutsk Province). Zhur.mikrobiol., epid. i immun. 42 no.9:96-100 S *65.

[MIRA 18:12]

1. Irkutskiy institut epidemiologii i mikrobiologii. Submitted March 4, 1964.

GLL'FAND, A. /e.

USSR/ Engineering - Conferences

Card 1/1

Pub. 128 - 16/31

Authors

Gel!fand, A. Ye., Engineer; Chernavskiy, G. N.; and Futoryan, S. B., Cand.

Tech. Sc.

Title

High-speed cutting with greater rates of feed

CONTROL OF THE PROPERTY OF THE

Periodical !

Vest. mash. 35/5, 43-47, May 1955

Abstract

Minutes are presented from the special technical conference held in Moscow (1954) at which different problems of high-speed metal cutting with a greater feeding rate were discussed. Names of participants and the institutions they represented are listed. Tables; graphs; drawings.

Institution :

Submitted :

CIA-RDP86-00513R000514620007-6" APPROVED FOR RELEASE: 08/23/2000

GEL FAND, A.YE., inzhener. Modern methods of obtaining optimum surface smoothness on machine parts. Rech. transp. 15 no.8:25-30 Ag *56. (MLRA 9:11) (Metals--Finishing) (Surfaces (Technology))

FUTORYAN, S.B., kand. tekhn. nauk; red.; GEL'FAND, A.Ye, inzh., red.; SUVOROVA, I.A., red. izd-va; PUKHLIKOVA, W.A., tekhn. red.

[Cutting with powdered metal tools; a collection of papers at a technical meeting] Resante mineralokeramicheskimi instrumentami; sbornik dokladov nauchno-tekhnicheskoi sessii. Moskva. Gos. izd-vo obor. promyshl., 1958. 206 p. (MIRA 11:8)

1. Nauchno-tekhnicheskoye obshchestvo mashino-stroitel'noy promyshlennosti. Moskovskoye otdeleniye.

(Cermets) (Metal-cutting tools)

S/121/60/000/012/003/015 A004/A001

AUTHOR:

Gel'fand, A. Ye.

TITLE:

The Grinding of Carbide Die Parts With Diamond Wheels on Surface and

Circular Grinding Machines

PERIODICAL: Stanki i Instrument, 1960, No. 12, pp. 6-9

TEXT: According to investigations carried out by the VNIITS it was found that the best sintered tungsten carbide grade for the manufacture of blanking die parts is the BK 20 (VK20) grade. Moreover, it was found that the most efficient method of finish machining of sintered carbides is the grinding by diamond wheels, ensuring an accuracy of up to the 1st class inclusively and a surface finish up to the 13th class. To find out the most favorable characteristics of diamond wheels and diamond grinding conditions, surface and cylindrical grinding of blanking die parts made of VK20 sintered tungsten carbide have been studied by the NIIAmaz. VK20 specimens with the dimensions 47 x 59 x 30 mm and control specimens of 4 x 4 x 40 mm were preliminarily machined with the K3 46-60 CM1K (KZ46-60 SM1K) wheels. Then they were ground with diamond wheels cooled with a 36 soda solution. The following points were investigated: 1) surface finish (the specimens were

Card 1/3

S/121/60/000/012/003/015 A004/A001

The Grinding of Carbide Die Parts With Diamond Wheels on Surface and Circular Grinding Machines

checked with the $\Pi \Upsilon$ -2- PCh-2-profile gage); 2) absence of cracks (checking was effected with a magnifying glass of 20 diameters magnification and with a metallographic microscope of 100 diameters magnification); 3) machining productivity in mm3/min (the quantity of carbide removal was determined with a micrometer, while the machining time was measured with a stopwatch); 4) specific wear q of the diamond wheels in milligram/gram of sintered carbide. The tests were carried out with ANN (APP) 200 x 10 x 75 diamond wheels which were bakelite-bonded and had a grain size of 150, 180, and 240 respectively. To find out the most favorable concentration, bakelite-bonded APP-wheels with 25, 50, and 100% concentration were tested. As a result of the tests it was established that bakelite-bonded wheels with 50% concentration of 180-mesh diamonds showed the best characteristics for surface and circular grinding, producing sharp cutting edges and high surface finish. Optimum conditions for surface grinding with cooling were: depth of cut t = 0.03 mm, longitudinal feed slong = 3 m/min, cross feed scross = 0.6 mm per run; wheel speed $v_k = 29 \text{ m/sec.}$ The respective figures for cylindrical grinding are: depth of cut - 0.01 mm, longitudinal feed 0.5 m/min, working speed - 12.5 m/min. The specific wear of diamond wheels at optimum wheel characteristics and grinding

Card 2/3

S/121/60/000/012/003/015 A004/A001

The Grinding of Carbide Die Parts With Diamond Wheels on Surface and Circular Grinding Machines

conditions under laboratory conditions amounted to 0.8 milligram/gram, using VK20 sintered tungsten carbide with cooling on surface grinding machines. The respective figure for circular grinding is 2.14 milligram/gram. If it is necessary to use for the surface grinding of VK20 carbides 180-mesh diamond wheels with 256 concentration and organic bond, the following grinding conditions are recommended: depth of cut T = 0.03 mm; longitudinal feed slong = 2 m/min; cross feed scross = vith 100% concentration with organic bond makes it possible to increase the machining productivity, but, on the other hand, the wear of the diamond wheels is also increased considerably. The optimum machining conditions for wheels with 100% concentration are: depth of cut t = 0.04 mm, longitudinal feed slong = 4 m/ min, cross feed scross = 0.6 mm per run. The optimum conditions for circular grinding operations with 180-mesh diamond wheels of 50% diamond concentration with organic bond are the following (grinding with cooling): depth of cut t = 0.01 mm per 5 table strokes, longitudinal feed slong = 0.5 m/min and working speed 12.5 m/min. There are 7 figures.

Card 3/3

GEL'FAND, Aleksandr Yevseyevich, inzh.: GETSOV, Iosif Yefremovich, kand.
tekhn. nauk; CHERNOV, M.I., retsenzent; DOLGOLENKO, P.V., retsenzent; TYUTCHEV, N.A., red.; VITASHKINA, S.A., red. izd-va; YERMAKO-VA, T.T., tekhn. red.

[Precision and finish of the machining of parts in repairing ship machinery] Tochnost' i chistota obrabotki detalei pri remonte sudovykh mekhanizmov. Moskva, Izd-vo "Rechnoi transport," 1961. 151 p.
(MIRA 14:12)

(Marine engines-Maintenance and repair)

229**19** S/121/61/000/007/004/004 D040/D112

11100

2908

AUTHOR:

Gel'fand, A.Ye.

TITLE:

Diamond wheel grinding for hard-alloy mill rolls

PERIODICAL: Stanki i instrument, no. 7, 1961, 28-31

TEXT: Hard-alloy rolling mill rolls could not be finished to the required class 12 mirror finish at the Leningradckiy staleprokatnyy zavod (Leningrad Steel Rolling Plant) and Beloretskiy provolochno-kanatnyy zavod (Beloretsk mire Rope Plant). The diameter tolerance for these rolls is 0.005 mm; finish-grinding \$\times 60 CM2 \times (KZ60SM2K) \text{ wheels and superfinishing were employed. The rolls were dull, and the rolled metal had to be polished after rolling. This was the reason why hard-alloy rolls were not much used despite their this was the reason why hard-alloy rolls were not much used despite their advantages and the fact that they had a 20 - 50 times higher wear resistance advantages and the fact that they had a 20 - 50 times higher wear resistance advantages and the fact that they had a 20 - 50 times higher wear resistance advantages and the fact that they had a 20 - 50 times higher wear resistance advantages and the fact that they had a 20 - 50 times higher wear resistance advantages and the fact that they had a 20 - 50 times higher wear resistance advantages and the fact that they had a 20 - 50 times higher wear resistance advantages and the fact that they had a 20 - 50 times higher wear resistance advantages and the fact that they had a 20 - 50 times higher wear resistance advantages and the fact that they had a 20 - 50 times higher wear resistance advantages and the fact that they had a 20 - 50 times higher wear resistance advantages and the reason why hard-alloy rolls were not much used despite their

22919

S/121/61/000/007/004/004 D040/D112

Diamond wheel grinding for hard-alloy mill rolls

Ann 200x10x75 (APP200x10x75) diamond wheels with an organic bond. The coolant consisted of 0.60% sodium triphosphate, 0.10% sodium nitrate, 0.05% vaseline oil, 0.30% borax, 0.25% calcined soda, and 98.70% water. Class 12 mirror finish was obtained by diamond wheels with a granularity AM -10 (AM-10) and a 50% diamonds concentration; the wheel speed was 29.3 m/sec, roll velocity 30 m/min, cutting depth 0.0025 mm and longitudinal feed 0.3 m/min. Fifteen last-finish passes were made. Diamond wheel grinding resulted in a reduction of labor-consumption of up to 8 times in the finishing operations and eliminated cracking caused by green silicon carbide wheels. Polishing after rolling was no longer necessary. There are 12 figures.

Card 2/2

POPOY, S.A.; GEL'FAND, A.Ye.

Stresses penerated by surface grinding of hard alloys with diamonal wheels. Sten.1 instr. 32 no.11:35-36 N '(). (Mida 14:10) (Grinding and polishing)

GEL!FAND, A.Ye., inzh.; NOVGORODOV, A.S., inzh.; FOTEYEV, N.K., kand. tekhn. nauk; CHETVERIKOV, S.S., doktor tekhn. nauk, prof., retsenzent; IVANOVA, N.A., red. izd-va; SMIRNOVA, G.V., tekhn. red.

[Machining of hard alloys] Obrabotka tverdykh splavov. Moskva, Mashgiz, 1963. 243 p. (MIRA 16:5) (Ceramic metals) (Metal cutting)

PHASE I BOOK EXPLOITATION

SOV/6436

- Gel'fand, A. Ye., Engineer, A. S. Novgorodov, Engineer, and N. K. Foteyev, Candidate of Technical Sciences
- Obrabotka tverdykh splavov (Machining of Hard Alloys) Moscow, Mashgiz, 1963. 246 p. Errata slip inserted. 7500 copies printed.
- Reviewer: S. S. Chetverikov, Doctor of Technical Sciences, Professor; Ed. of Publishing House: N. A. Ivanova; Tech. Ed.: G. V. Smirnova; Managing Ed. for Literature on Cold Working of Metals and Machine-Tool Making: S. L. Martens, Engineer.
- PURPOSE: This book is intended for engineering personnel of machine-building plants and planning and educational institutes.
- COVERAGE: The book presents information on hard alloys, methods of making hard-alloy semifinished products, processes of abrasive, diamond, electrospark, and ultrasonic machining

Card 1/8

Machining of Hard Alloys

SOV/6436

of hard-alloy tools (cutting tools, gages), parts of cutting and heading dies, rolling-mill rolls, etc. Recommendations for practical application are given, and machining conditions, tools, and equipment are described. Ch. I was written by A. S. Novgorodov; Chs. II and III, by N. K. Foteyev; and Chs. IV-VI, by A. Ye. Gel'fand. There are 74 references: 67 Soviet and 7 English.

TABLE OF CONTENTS:

Introd	luction	3
Ch. I. 2.	Sintered Hard Alloys General information Physicomechanical properties of alloys Hardness Bend strength Impact toughness	7 7 10 16 17 18

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Card 2/8

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R000514620007-6"

หรือเหมายาการและ และ เกาะราย เกาะราย

GEL'FAND, A.Ye. Grinding BK20 hard alloy with diamond wheels on metallic bond.
Stan.i instr. 34 no.1:30-32 Ja '63. (MIRA 16:2)
(Diamonds, Industrial)
(Grinding and polishing)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R000514620007-6"

L 13261-65 EWT(m)/EWA(d)/EWP(t)/EWP(b) ASD(m)-3 MJW/JD S/0121/614/000/010/0033/0036

AUTHOR: Gel'fand, A. Ye.

Ź

TITLE: The effects of diamond wheel grinding regimes on the properties of the solid alloy VK20 4

SOURCE: Stanki i instrument, no. 10, 1964, 33-36

TOPIC TAGS: grinding, metal mechanical property/ APP200 disk, VK20 alloy

ABSTRACT: The effects of different operating regimes of diamond wheel grinding on the mechanical and surface properties of the alloy VK20 were experimentally investigated using disks (Type APP200x10x75) with bakelite bonding (B1) (50% diamond content, grain size A6) and metallic bonding M1 (100% diamond content, grain size A8) on 4.5 x 4.5 x 35 mm samples at a wheel speed of 3) m/sec. The samples were ground on all 4 sides and tested for strength in bending, impact strength, surface characteristics, and Rockwell hardness. Some samples were finished and polished to study subsurface (about 1 mm deep) effects. Tests with the bakelite bonded wheels were cooled with 6-7 liter/min of 3% soda solution. With longitudinal feed of 3.0 m/min and transverse feed of 0.5 mm/pass a change of grinding depth from t = 0.01 - 0.05 mm did not change the strength in bending. Changing the longitudinal feed from 2-5 m/min (0.5 mm/pass, t = 0.03 mm) only decreased the strength from Cord 1/2

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298 to 263 kg/mm². Changing the transverse feed from 0.2-1.5mm/pass (3 m/min, t = 0.03 mm) did not affect t_b, no cracks could be found, the hardness varied between 76-80 RA in all operating regimes, and the surface finish was class 9-10. Tests with the MI bonded wheels were performed with and without cooling. Changing t = 0.03-0.08 mm with cooling and t = 0.02-0.05 mm without cooling (\(\mu\) m/min, 0.5 mm/pass) showed no cracks but tear-outs increased from 3-30 micron depth and 20-50 micron depth for cooled and uncooled regimes respectively. Strength in bending decreased from 193 to 59 kg/mm and 120 to 65 kg/mm respectively while the impact strength decreased from 0.445 to 0.168 kgm/cm² and 0.450 to 0.062 kgm/cm² respectively. It was found that preliminary grinding should be performed with metal bonded wheels under conditions not exceeding v = 30 m/sec, longitudinal feed \(\mu\) m/min, 0.5 mm/pass, and t = 0.03 mm with cooling, and the final grinding should be done with bakelite bonded wheels. Orig. art. has: 7 figures.

ASSOCIATION: none

SUBMITTED: 00

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SUB CODE: MM

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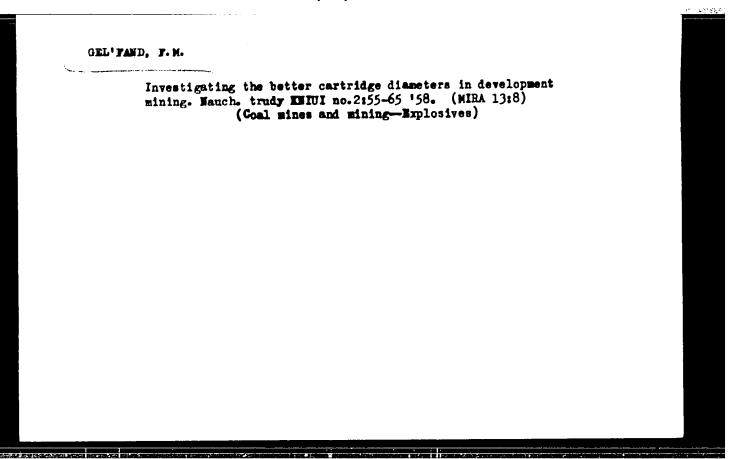
Card 2/2

GEL'FAND, F.

Sections, commissions, committees. NTO 2 no.1:55~56
Ja '60. (MIRA 13:5)

1. Predsedatel sektsii burovsryvnykh rabot Karagandinskogo oblastnogo pravleniya Hauchno-tekhnicheskogo obshchestva gornoye. (Technical societies)

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GEL'FAMD, F. M. Cand Tech Sci — (diss) "Investigation of the Short-delayed Explosion in Conducting Preliminary Workings in Mines of the Karaganda Basin," Alma-Ata, 1960, 17 pp, 200 copies Kazakh Polytechnical Institute) (KL, 49/60, 127)

GEL'FAND, J.M.

Similarity of rock breaking processes. Ugol' 35 no.5:57-60 My '60. (MIRA 13:7)

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M U	aking fuller use (gol' 35 no.7:31-34	of the potentials of J1 '60.	short-delay blasting. (MIRA 13:7)	
1	. Karagandinskiy	nauchno-issledovatel (Nining engineering	skiy ugol'nyy institut.	

GEL'FAND, F.M., inzh.; MARKMAN, L.D., inzh.; MUKHAMEDIN, S., tekhnik; MIKHAYLYUK, V.N., tekhnik

The RPM-2 bit for the rotary boring of holes in rocks. Shakht. stroi. 5 no. 3:12-14 Mr *61. (MIPA 14:2)

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"Electronic computer technology and applied cybernetics in mining abroad" by V.T.Koval's Reviewed by L.M.Alotin, F.M.Gol'fand. Gor. zhur. no.1:80-p.3 of cover Ja '64. (MIRA 17:3)

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IVANCHENKO, G. Ye.; GEL'FAND, F.M.; YEFIMOV, V.V.

Operating conditions of the vibration percussion mechanism of the VBU-1 drill. Nauch. trudy KNIUI no.13:332-335 164 (MIRA 18:1)

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GELIFAND, F.M., MAMAYEV, V.I.

Determining the speed of boring with air hammers. Nauch. trudy KNIUI no.14:230-234 *64.

Compaction of cartridges in multiple blasting and detarmining the safe distance between charges, 151d.:239-2

"Channel effect" phenomenon as one of the cause for the dying out of the detonation of berehole charges. Ibid. \$245-251 (MIRA 18:4)

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GEL'FAM), F.M.; BORUNOV, V.L.; YEFIMOV, V.V.; LAZAMET, V.E.

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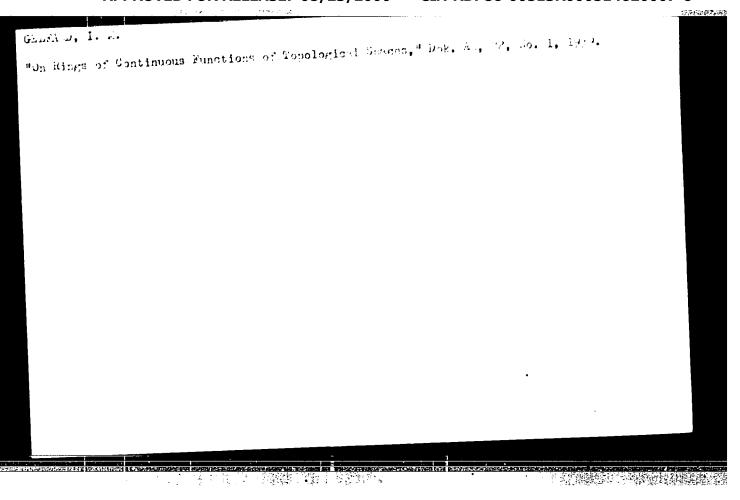
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人名英格兰 医克里氏管 医皮肤 医皮肤

GELFAND, I. M., FEYNEERG, S. M., FROLOV, A. S. and CHENTSOV, N. N.

"Concerning the Use of the Random Test Method (Monte-Carlo Method) for Solving the Kinetic Equation."

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PA - 2030 On the Quantities with Anomalous Symmetry and on a Possible Expla-UTHOR: nation of the Degeneration (with Respect to Symmetry) of K-Mesons. Zhurnal Eksperimental noi i Teoret. Fiziki, 1956, Vol 31, Nr 6, TITLE:

PERIODICAL: Reviewed: 3 / 1957 pp 1107-1109 (U.S.S.R.)

e duny disense de la company de la compa

Received: 1 / 1957 Within the limits of experimental accuracy the rest masses of

 Θ - and τ -mesons are equal and this equality is called the "degeneration of K-mesons with respect to symmetry". In this connection the examination of the behavior of the corresponding quantities with reflections is of interest. Besides, such examinations are interesting themselves. Besides the well-known possible symmetries with respect to space and time reflections there is an additional possibility which is here called "anomalous

It is purposeful to determine the transformations of the quantities with respect to one or the other group with an accuracy leaving one factor arbitrary. Well-known examples for the occurrence of such factors are the spinors or the wave functions of a system of particles which obey the FERMI statistics. The corresponding mathematical notions are the so-called projective representations of one group. Here the representation of a group

Card 1/3

ABSTRACT:

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PA - 2030

On the Quantities with Anomalous Symmetry and on a Possible Explanation of the Degeneration (with Respect to Symmetry) of K-Mesons.

of reflections consisting of the following four elements is examined: the element of the unit and of the operators of the time-dependent, spatial, and time-space reflections. With transpositions of the operators Tt (a certain projective representation of the reflection groups) the quantities transformable by the operators of the representation have four possibilities of symmetry. The only additional possibility follows if the demand of transpossibility of the operators is renounced. Then the relations between the operators can be expressed by a matrix. In the simplest case, with the transformation of scalar quantities, the operators can be written in the form of three anti-commuting matrices of second order which are analogous to the well-known PAULI matrices. The quantities to be transformed ("scalars with anomalous symmetry" form numerical pairs which do not change during the transformation proper and which transform during reflections according to the matrices already mentioned. The irreducible representation of the LORENTZ group, together with the reflections, decomposes into two representations of the

Card 2/3

PA - 2030

On the Quantities with Anomalous Symmetry and on a Possible Explanation of the Degeneration (with Respect to Symmetry) of K-Mesons.

LORENTZ group proper. Thereby four normal and one not normal possibilities exist. This and other considerations permit the subdivision of the particles into classes with normal and not normal symmetry. Attributing the not normal symmetry to the K-mesons and the normal one to the pions, the same normality would follow for the particles Λ , Γ just as for the particles Λ , Γ . For this purpose the consideration of one reaction with strong reciprocal effect suffices. The K-meson can exist in two different states with different space symmetry and equal mass.

ASSOCIATION:

Not given.

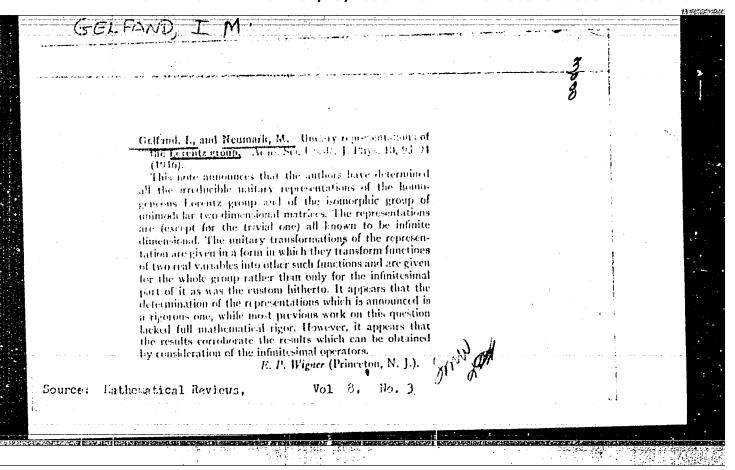
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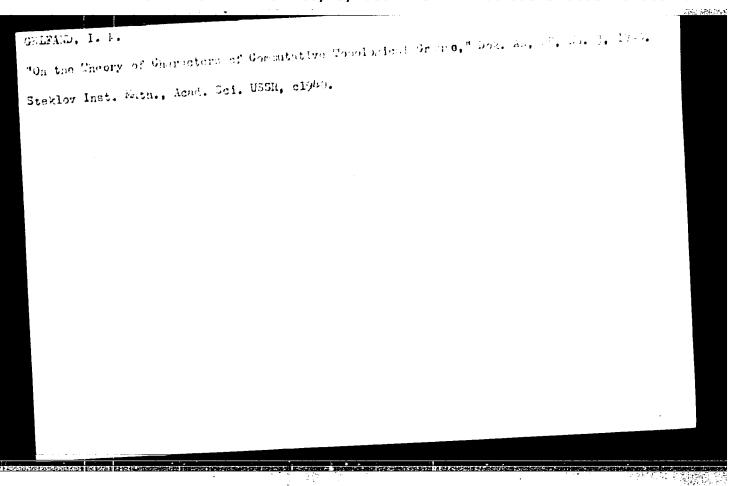
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GEL FAND, I.M.; GRAYEV, M.I.

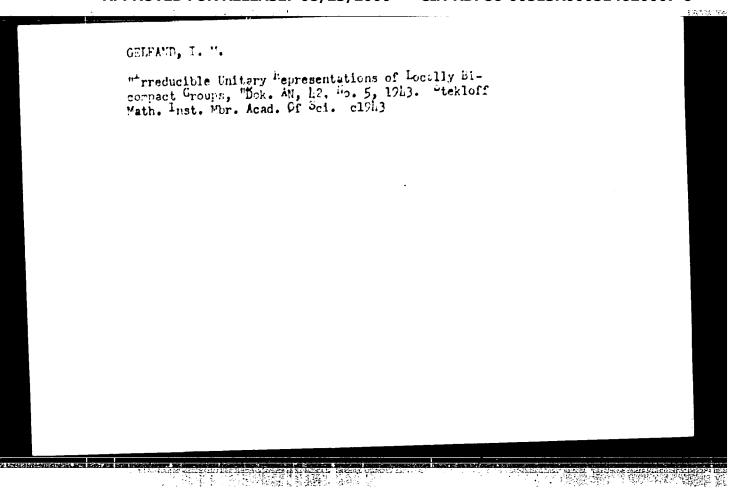
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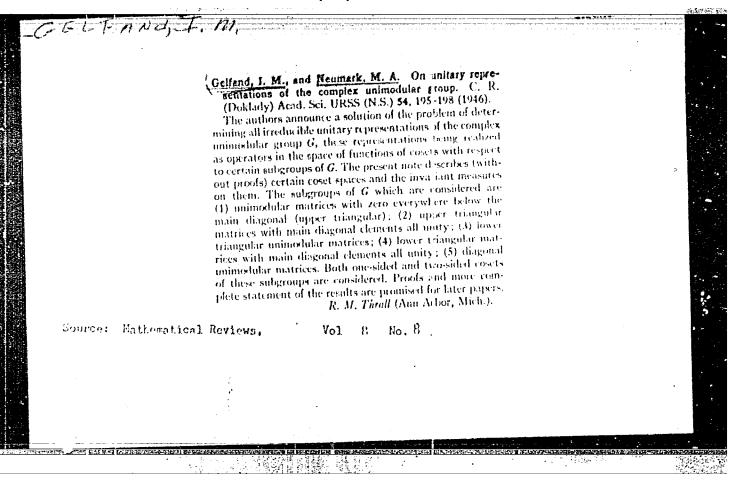
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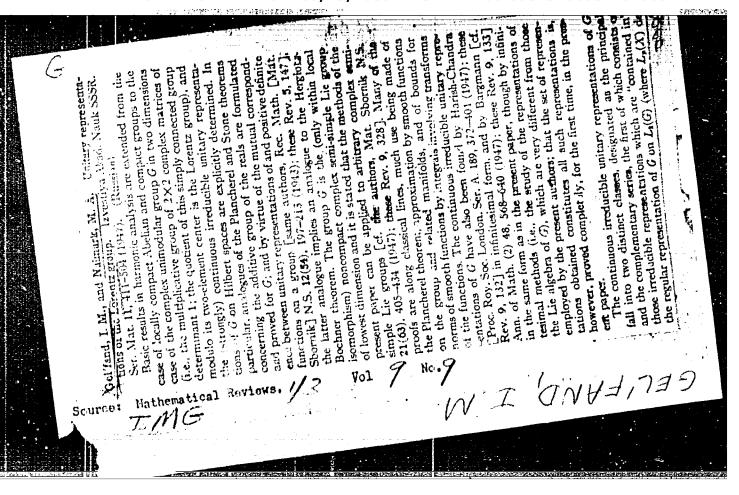


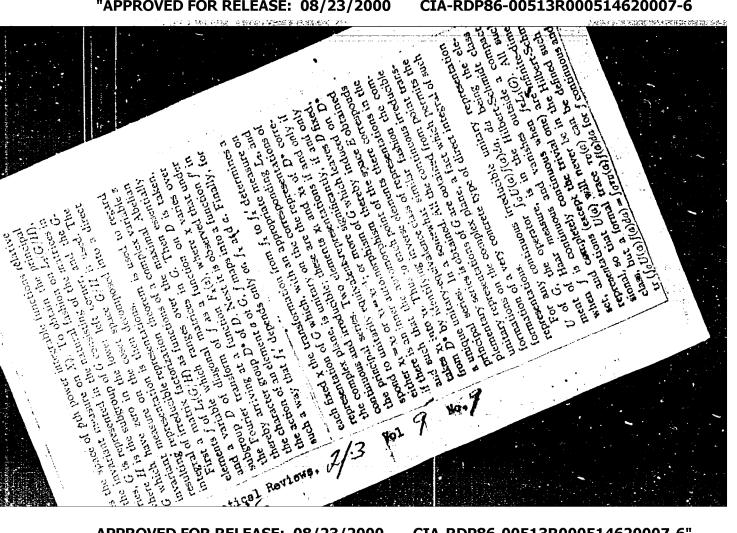
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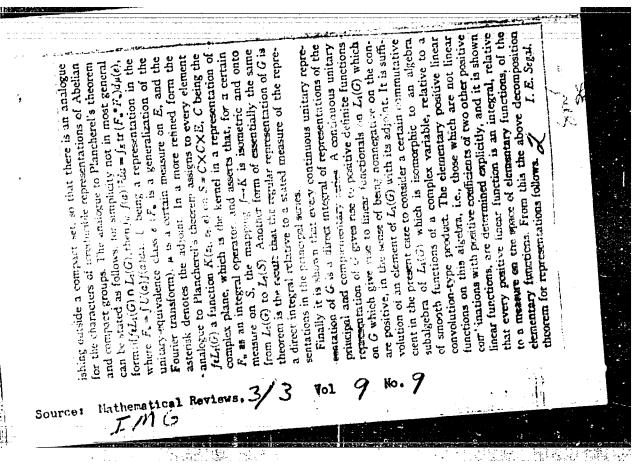


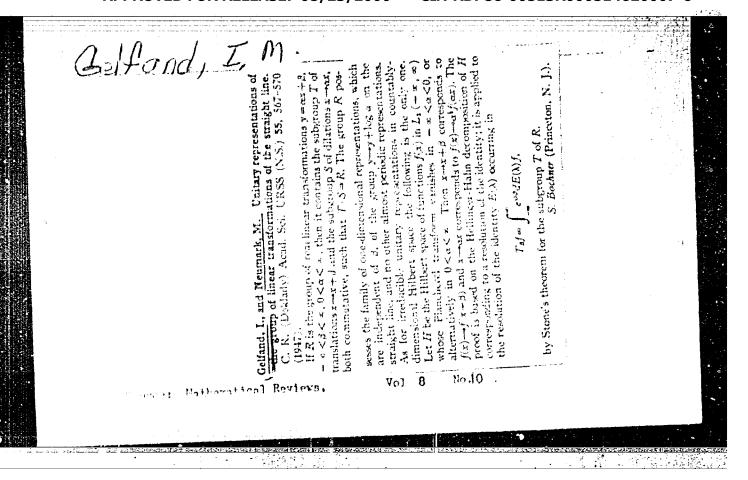


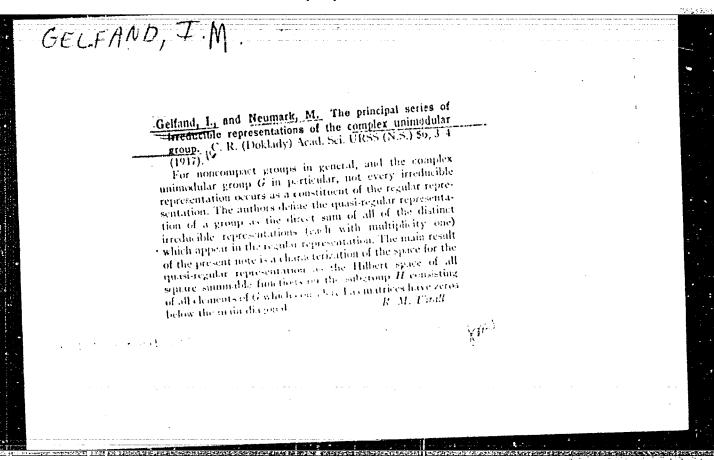
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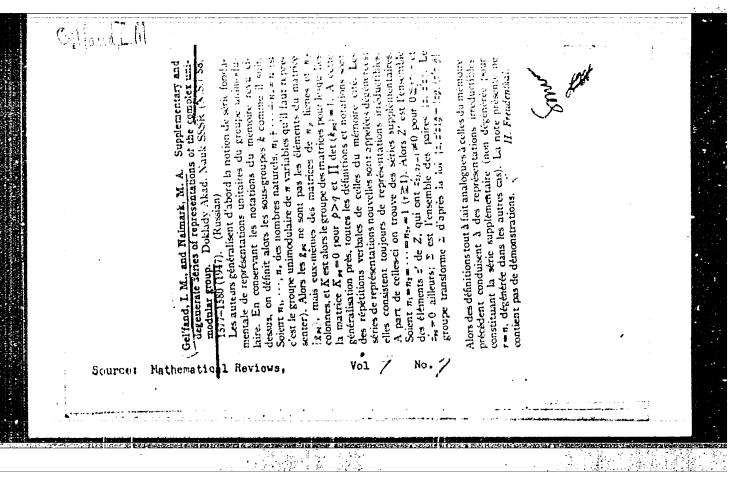
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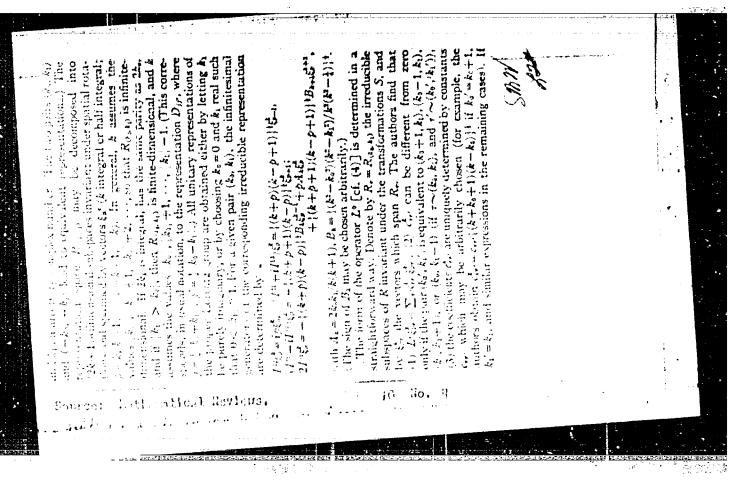




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	Selfand, I. M., and Yaglom, A. M. General Lorentz in- Variatic Equitions and infinite-dimensional representa- tions of the Lorentz group. Akad. Nauk SSSR. Zhurnal Eksper. Teoret. Fiz. 15, 703-753 (1949). (Russian) [A short acream, of the soyer's main results was pith- lished to bookhaly. Akad. Nauk SSSR (N.S.) 59, 655-425 (1948), these Rev. 9, 476, 71he authors invasigate Larrents invariant equations of the form [D. 104, 2a+ tay=0.] [A short acream of the form [D. 104, 2a+ tay=0.] [A short acream of the form [D. 104, 2a+ tay=0.] [Burner operations of the form [D. 104, 2a+ tay=0.] [Burner operations of A. and s is a morvanishing reference of the form of the indiversional vector space K. L. [Burner operators of A. and s is a morvanishing reference of the form of the corrust former of a transformation ν=√=5 y such that the S form a re- [Burner operators of A. and s is a morvanishing reference with the contraction of all systems (L.) astiffting the relations (E.) [A transformation p. 4 = 5 y such that the S form a re- [Burner operator of A. and show that the S form a re- [Burner operation of J. Baystons (L.) astiffting the relations (E.) [Burner operation of J. Baystons (L.) astiffting the relations (E.) [Burner operation of J. Baystons (L.) astiffting the relations which follow from (2). Let x - x' = x' + e ₁ x = x + g ² x + g ² x be an infinite into D and satisfy the well-known commutation - into the follow of the relation of the purple of the representation are sufficient to insure (2) if only representation in plays [Burner operators of the solution of the following system: [A) [Let fol] (A = - e ₂). Then ψ - following systems: [A) [Let fol] (A = e ₂) (B + following systems: [A) [Let follows are sufficient to insure (2) if only representations are sufficient to insure (2) if onl	
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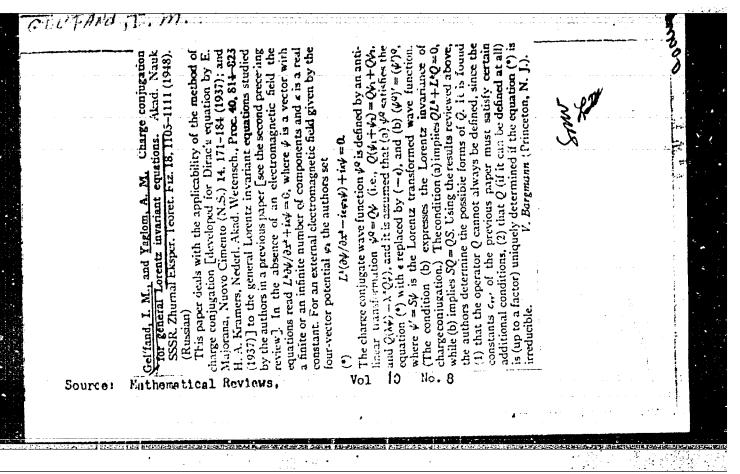
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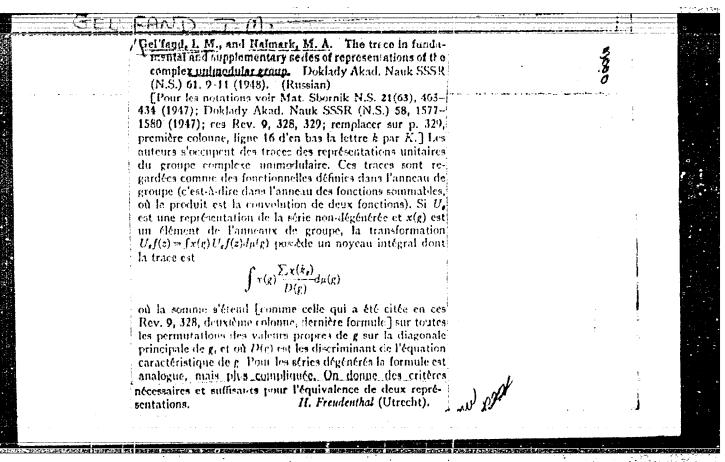


densities or total energies. The authors base their proof on tion into plane waves with time-like wave vectors; the wave equation, nowever, also admits plane wave solutions where the decomposition of the general solution of the wave equa k_0 (D) If, for some r_i both \bar{k}_i and k_i are integral, the charge is indefinite; if both k; and k; are half irtegral, the energy is indefinite. There remains the possibility that of the two energy density are definite. [Reviewer's note. While the assertion concerning the charge density is correct, one can construct solutions with both positive and negative energy numbers ks, kt one is integral and the other half integral, as The authors assert that in these two cases both charge and energy is indefinite for a half integral 1,' (C) If, for ome r, k, is real, but 2k, is not integral, the charge is indefinite for preted as either charge (energy) density or total charge (energy)). (A) II, for some $r, k_i'' \neq 0$, and $2k_i'$ is not integral, $k_l^{\prime\prime}
eq 0$, the charge is indefinite for an integral $\hat{x}_l^{\prime\prime}$, and the an integral k, and the energy is indefinite for a half integral in the two cases (1) rand (11) [cf. the preceding review] in $D_{m k},$ the authors establish the following results (in the one of the following statements charge (energy) may be interneither charge nor energy is definite (B) If, for some r, tëpresentations $r\sim(k_3,k_1)$ (where $k_1=k_1'+ik_1''$) which occur more specifically, those equations which are derived from of the preceding review]. By discussing the irreducible ential operations. The authors generalize this theorem to wave functions with an infinite number of components an invariant Lagrangian [cf. the preceding review, to which the reader is referred for details]. Charge and energy density are given by st and Tet, respectively [cf. equations (8) and wave equations are differential equations and the expressions for charge and energy density are charactly by differdensity nor the total energy may be definite, provided the which satisfy the equations Audied in a previous paper definite, for half integral spin values neither the energy following theorem concerning Lorentz invariant equations for wave functions with a finite number of components. For charge of the system described may be (positive or negative) The first of these two japping merely gives the main Physical Rev. (2) 58, 716-722 (1940)] has preved the integral spin values acither the charge density nor the total for general Lorentz invariant equations. Akad. Nauk SSSR. Zhumal Eksper. 1coret. Fig. 19, 1096-1104 results; the second contains the detailed proofs. W. Pauli Gel'fand, I. M., and Yaglom, A. M. Pauli's theorem a definite energy. Doklady Akato, Nauk SSSR (N.S.) On Lorentz myañ a definite charge a ant constions to which correspond (Russian) Yagiom, A. 63, 371-374 (1948). I., and (Russim) Gel'fard, I. M (1948). 9 No. 8 10 Vol Mathematical Reviews, Sources

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ELEAND, I.M

Gel'fand, I. M., and Nalmark, M. A. On the connection, observed the representations of a complex semi-simple Lie group and those of its maximal compact subgroups. Tokkinly Akad. Nauk SSR (N.S.) 63, 225-228 (1948).

The "nondegenerate" continuous (in the strong topology) irreducible unitary representation on Hilbert spaces of complex amissimple Lie groups (especially of the complex unimeshi ar group), and their contractions to maximal compact subgroups, are described in concise terms, in continuation of earlier work by the same authors [Mat. Shornik N.S. 21(63), 405-434 (1947); Izvestiya Akad. Nauk SSSR. Ser. Mat. 11, 411-504 (1947); these Rev. 9, 328, 495]. Any such representation o-T, of the group G has as a representation space a Hilbert space of all square-integrable functions. relative to a measure depending on the representation (though simply the unique invariant measure for the representations in the principal series), over the right coset space U/Γ , where U is a maximal compact subgroup of G and $\Gamma = U \cap D$, D being a maximal Abelian subgroup of G generated by a regular element. Each coset of U modulo I is contained in exactly one right coset of G modulo K, where K is the subgroup of G generated by the positive roots of its Lie algebra. The functions f on U/Γ can thereby be

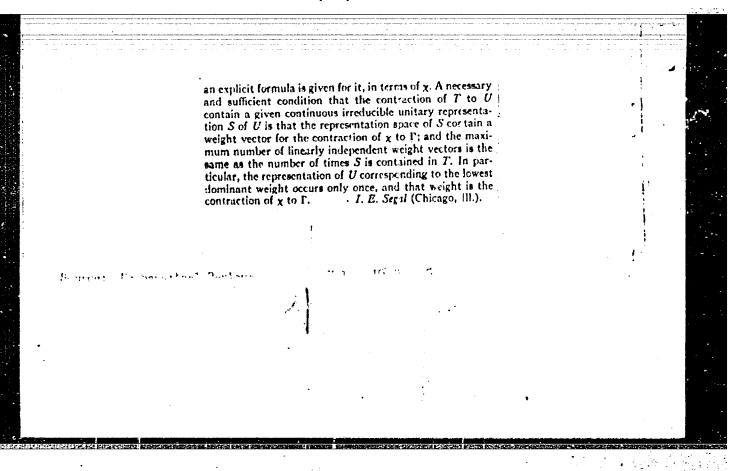
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identified with those functions \tilde{f} on G/K which have the property $\bar{f}(\gamma u) = \bar{f}(u)$, $\gamma \epsilon V$, and the integral of f over U/Vis the same as the integral of \tilde{f} over G/K (relative to the respective invariant measures). The representation T can be most conveniently described by its action on the 1invariant functions f over G/K, and has then the form $(T_{\alpha}f)(x) \approx a(xa)(a(x))^{-1}f(xa)$, where α is a function determined (via a way of factoring the elements of G) by a character χ of D (of absolute value one for the principal series and not necessarily bounded for the complementary series), and is uniquely determined by the equivalence class of the representation within multiplication by a function of absolute value one. In case G is the complex unimodular group, U can be taken as the unitary elements, D as the diagonal elements, and K as those elements which are zero below the diagonal.

A necessary and sufficient condition that T have in its representation space a nonzero vector x invariant under the T_* , at U_* is that χ be trivial on Γ_* if x exists, it is unique within multiplication by nonzero numbers, and (T_*x,x) is a positive definite function on G which is invariant under two-sided translations by elements of U. This function is called the spherical function of the given representation and

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square integrable function on G_n , $n \ge 3$, then Gel'fand I. M., and Nalmark, M. A. The analogue of $\int |x(g)|^{2} d\mu(g) = (n!)^{-1} (2\pi)^{-(n-1)(n+1)}$ Plancherel's formula for the complex unimodular group. Doklady Akad. Nauk SSSR (N.S.) 63, 609-612 (1948). $\times \sum_{m_1, \dots, m_n = -m} \int_{-m}^{\infty} \dots \int \left[\int |K(s', s'', \chi)|^2 d\mu(s') d\mu(s') \right] \times a(\chi) d\rho_1 \dots d\rho_n.$ (Russia1) An analogue of Plancherel's formula is obtained for functions on the complex unimodular group G_n in n dimensions, where n 3. The analogue for the case n=2 was established by $K(s', s'', \chi) = \int \chi(s'^{-1}\delta(s'')\beta^{-1}(\delta)\chi(\delta)d\mu(\delta)d\mu(\delta).$ the same authors in an earlier paper [Izvestiya Akad, Nauk SSSR. Ser. Math. 11, 411-504 (1947); these Rev. 9, 495] $a(\chi) = \prod_{1 \le \rho < q \le 1} [(n_{\rho} - n_{q})^{2} + (\rho_{\rho} - \rho_{q})^{2}], \quad \eta_{1} = \rho_{1} = 0.$ and the formula for n 23 is similar in general character to that for the case n = 2. However, a new circumstance arises in the case n = 3 in the existence of a new type of family The integral defining K is convergent (in mean) relative to among the "supplementary" irreducible representations of the norm defined by the square root of the right side of the the group, called the "degenerate" representations ("supformula. plamentary" mears that the representation is not contained In case $x \in L_1(G)$, then $K(x', x'', \chi)$ is the kernel of the completely continuous operator $T = \int U_{X,x} x(g) d\mu(g)$, rein the regular representation of the group). The result is as follows, in the no ation used by the authors in their detergarded as an operator on functions of s', and the trace

Source: Kathematical Reviews,

mination of the representations in the "fundamental" series

of G. (ar irreducible representation is in this series if it is

contained in the regular representation) [Mat. Sbornik

N.S. 21(53), 405-434 (1947); these Rev. 9, 328]; if x is a

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functions.

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of ToT is equal to the left side of the formula. The proof is

sketched for the case n=3, much use being made of factori-

zations for elements of G, and of a number of auxiliary

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I. E. Segal (Chicago, Ill.).

GEL'FAND, I.M.; NAYMARE, M.A.

[Unitary representations of classical groups] Unitarnye predstavleniia klassicheskikh grupp. Meskva, Isd-ve Akademii nauk SSSR, 1950. 288 p. (Akademiia nauk, Leningrad. Matematicheskii institut imeni V.A.Steklova. Trudy. 36) (Groups, Theory of)

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O. Likewort, I. M

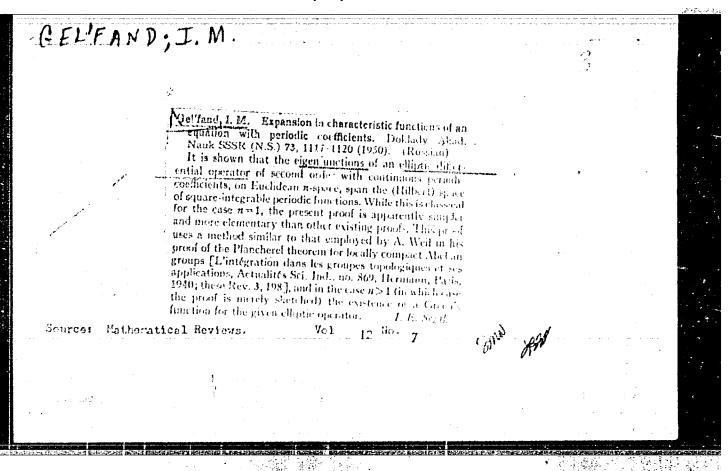
Gel'Iand, I. M., and Cetlin, M. L. Finite-dimensional representations of groups of orthogonal matrices, c. Doktody Akad, Naukissisk (N.S.) 71, 1017-1020 (1950). (Russian)

The authors give explicit formulas for the irreducible finite-d mensional representations of the Lie algebra of all skew-symmetric matrices of a given finite order, apparently in continuation of their similar work on the unimodelar group. As the foregoing Lie algebra is that of the orthogonal group, the irreducible finite-dimensional representations of these groups are thereby determined. Actually, relatively explicit formulas for these representations are classical.

I. E. Segal (Chicago, II.).
Source: Mathematical Reviews. Vol

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Co+author: Isetleri, a.L.



USSR/Nathematics - Differential Equations 11 Oct 50 Botmledness

"Boundedness of Solutions of the Equation $y^{**} + p(t)y = 0$, p(t + k) = p(t)," V. A. Yakubovich

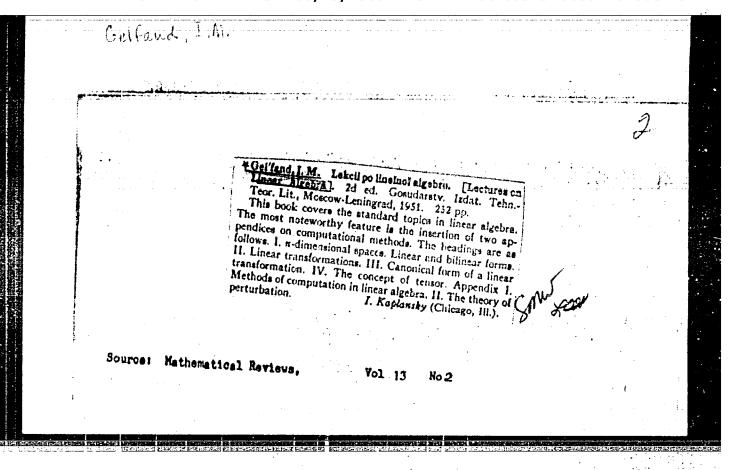
"Dok Ak Nauk SSSR" Vol LXXIV, No 5, pp 901-905

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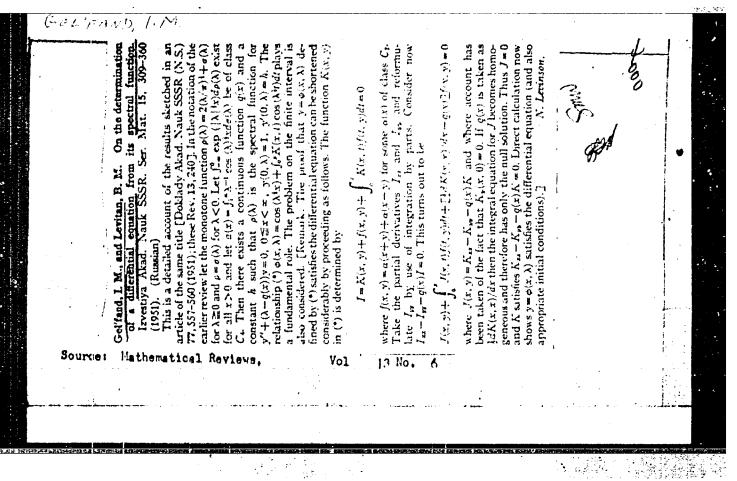
Derives 3 boundedness criteria for soln of arbitrary system of 2d order with continuous periodic coeff. Work based on idea advanced by I. M. Gel'fand at seminar in Moscow State U in winter 1948. Submitted by Acad A. N. Kolmogorov 4 Jul 50.

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"Generalized Functions and Their Application to Analysis, 'lecture reported in Uspeka. Hateant Nauk, 6, No. 4, 1951*	
* 7 Sessions Foreou Hath. Soc. 13 Mar-8 May 51.	
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Y. N. Dowker (Manchester).

offind I. M., and Fomin, S. V. Unitary representations
of Lie groups and geodesic flows on surfaces of constant
negative curreture. Doklacy Akad. Nauk SSSR (N.S.)
70, 771-774 (1931). (Russian)

The authors consider the spectrum of a geodesic flow on a surface of constant negative curvature. They show that this spectrum in the case of a 2-dimensional surface is a Lebesque spectrum (i.e. the spectral measures are all equivalent to the ordinary Lebesque measures). In case the surface is compact they show that the spectrum is at enumerably multiple Lebesque spectrum. The well known theorems of Hopf and Hedlund [cl. e.g. E. Hopf, Ber. Verthebren, Na.d. Wiss. Leipzig 91, 261–394 (1939); these Rev. 1, 243] can the metric transitivity and mixing properties of geodesic flows on surfaces of constant negative curvature follow as cerollaries.

production is a Lebesgue spectrum is a Lebesgue spectrum is to represent the geodesic flow as a flow defined on the co-set space G/N of the group G of real matrices of order 2 with determinant 1 modulo a suitable discrete subgroup N. The flow S_i is defined by means of multiplication by (7.%). The authors then appeal to the classification of irreducible unitary representations of the group G is a feeling and M. A. Nalmark, Izvestiya Akad, Nalmark, Izvestiya Akad, Nalmark, Izvestiya et Nalmark, Izvestiya and N. A. Nalmark, Izvestiya and M. A. Nalmark, Izvestiya

consequence.

By similar methods one can compute the spectrum of a flow defined on the co-set space G/N of any locally compact flow defined by a L-parameter subgroup N. The flow will be defined by a L-parameter subgroup s_1 of G provided the includible unitary representations of G are known. Needitying this unitary representations of G are known. Needitying this unitary are authors deduce that the spectrum of a geodesic flow on a surface of constant negative curvature of arbitrary dimension is an absolutely continuous spectrum (i.e. the spectral measures are absolutely continuous set functions). Proofs are either omitted or only sketched.

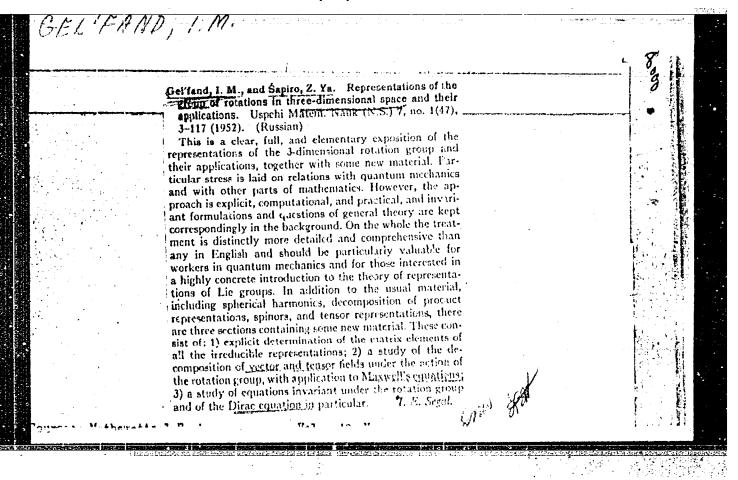
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trum is a Lebesgue spectrum. Their result follow-

Source: Mathematical Reviews,

"Unitary Representations of a Unirodular Group Containing a Single Representation of a Unitary Subgroup," by I.M.Gel fand and M. A. Maymark, Trudy Mosk., mat. ob., No. 1, 1952.

MIRA Nov 1952



GEL'FAND, I. M.

USSR/Mathematics - Geodesic Currents Jan/Feb 52

"Geodesics Currents on Manifolds of Constant Negative Curvature;" I. M. Gel'fand, S. V. Fomin

"Uspekh Matemat Nauk" Vol VII, No 1 (47), pp 118-137

Investigates geodesic currents on manifolds of const neg curvature by employing the method of spectra of suitable systems rather than the theoreticogroup method. Considers the interesting problem of establishing the multiplicity of the spectrum of geodesic currents. First studies the 2-dimensional case (geodesic currents on a surface) and later the general n-dimensional case.

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自由於自然的概念

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USSR/Mathematics - Eigenvalues "Spectrum of Non-Selfadjoint Differential Equations," I. M. Gel'fand "Usp Matemat Nauk" Vol 7, No 6 (52), pp 18284 Considers the spectrum of a non-selfadjoint differential operator given in an infinite region adjoint outside a certain finite region. Since adjoint outside a certain finite region. Since adjoint outside a certain finite region. Since does not bave to be real. However, it will be shown that the equation's complex spectrum is	discrete, that is, no single point of the spectrum, not lying on the real axis is the limit point for the points of the spectrum. Studies the equation - $\Delta u + p_1 u + p_2 u = \lambda u$.	49JBH
to spatell		GEL:FAND, I. M.

"Unitary Representations of Real Simple Lie Groups," Dok. All Secr., 86, No. 3, 1952

LTA December 1952

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GELFAND: I.A. Gel'fand, L. M., and Silov, G. B. Fourier transforms of rapidly increasing functions and questions of uniqueness of the solution of Cauchy's problem. Uspehl Matem. Nauk (N.S.) 8, no. 6(58), 3-54 (1953). (Russian) The methods employed by L. Schwartz in his Théorie des distributions [t. I, II, Hermann, Paris, 1950, 1951; these Rev. 12, 31, 833] are here extended to several new functionspaces and to the solution of certain problems in partial differential equations. The basic idea, which goes back to S. L. Sobolev [Mat. Sbornik N.S. 1(43), 39-72 (1936)], is to consider first a certain space Φ of "basic" (complex) functions, with a suitable topology. These functions are defined on R". A generalized function is then defined as a continuous linear functional T on D. The space of all such functionals is denoted by $T(\Phi)$. The functions in Φ are all infinitely differentiable and behave at infinity in such a way that the Fourier transform $\sum_{n=1}^{\infty} \exp \left\{-2\pi i (s_1 x_1 + \dots + s_N x_N)\right\} \varphi(x) dx = \tilde{\varphi}(s)$ is defined for all φ in Φ and is again an infinitely differentiable function with good behavior at infinity. $\tilde{\varphi}(s)$ may be defined for certain complex values $s = \{\sigma_1 + it_1, \sigma_2 + it_2, \dots, \sigma_N + it_N\}$. (0 VER)

Galfind, I.M.

The set of all $\tilde{\varphi}$ is denoted by $\tilde{\Phi}$. For $T \in T(\Phi)$, the Fourier transform T is defined as the generalized function on $\tilde{\Phi}$ such that $\tilde{T}(\tilde{\varphi}) = T(\varphi_-)$, where $\varphi_-(x) = \varphi(-x)$. For appropriate spaces Φ , every function f which is Lebesgue integrable on compact sets defines a continuous linear functional by $\varphi \to \int_{RN} f(x) \varphi(x) dx$, and thus a Fourier transform (no longer necessarily a function) is defined for all such functions f, no matter how rapidly they increase as $|x| \to \infty$. Differentiation of generalized functions is defined by the usual formula $(\partial T/\partial x_i)(\varphi) = -T(\partial \varphi/\partial x_i)$. A function f is a multiplier for a space Φ if $\varphi \in \Phi$ implies $f \varphi \in \Phi$ and $\varphi_n \to 0$ in Φ implies $f \varphi_n \to 0$ in Φ .

Before sketching the applications to Cauchy's problem, it is necessary to list some of the spaces Φ and Φ obtained. The first space S discussed consists of all functions φ which have partial derivatives of all orders such that φ and all partial derivatives of $\varphi \to 0$ as $|x| \to \infty$ more rapidly than any power of $|x|^{-1}$ [see L. Schwartz, loc. cit., t. II, p. 89]. A sequence $\{\varphi_n\}$ of elements of S converges to 0 if and only if for every $\epsilon > 0$, natural number r, and mixed partial derivative D^q , $(1+|x|^q)^r|D^q\varphi_n(x)| \le \epsilon$ for all x and all $n \ge \text{some } n_0(r, q, \epsilon)$. The space K consists of all $\varphi \in S$ having compact support [see L. Schwartz, loc. cit., t. I, p. 21].

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	<u> </u>			The space K_p $(p>1)$ consists of all $p \in S$ such that for all D^p , there exist constants C_1 and $C>0$ for which	1 3)5		
				$ D^{\epsilon}\varphi(x) \leq C_1 \exp\left\{-C x ^{\epsilon}\right\}.$			
				A sequence $\{\varphi_n\}$ in K_p converges to 0 if $\varphi_n\to 0$ uniformly in \mathbb{R}^N and $ D^q\varphi_n(x) \leq C_1\exp\{-C x ^p\}$, where C and C depend upon q but not on n . The space \mathbb{Z}^p $(p\geq 1)$ consists of all $\varphi(x) \in S$ which are extensible to analytic functions of the N complex variables	•		
		· · · · · · · · · · · · · · · · · · ·		$\{s_1, \dots, s_n\} = \{x_1 + iy_1, \dots, x_N + iy_N\} = x + iy_n$ and such that			
: .				$P[\varphi] = \int_{-\infty+i\varphi}^{\infty+i\varphi} P(x+iy)\varphi(x+iy) ^2 dx < C_1 \exp\{C y ^{\varphi}\},$			
	:			where P is an arbitrary polynomial and C_1 and C are constants depending upon P and φ . A sequence $\{\varphi_n\}$ in Z^p converges to 0 if $\varphi_n(Z) \to 0$ uniformly on all compact subsets of complex N -space and P \subseteq \mathbb{R} .	} •		
				space Z_p^p consists of all $\varphi(s_1, \dots, s_n)$ which are analytic for all values of z_1, \dots, z_n and such that	Covery		***
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 $|\varphi(s_1, \dots, s_N)| \leq K \exp\left\{\sum_{i=1}^N e_i C_i |s_i|^p\right\},$

where the C_i are positive constants and $\epsilon_i = +1$ for ϵ_i non-real and $\epsilon_i = -1$ for ϵ_i real $(j = 1, \dots, N)$. Convergence is defined as being uniform on compact sets and with uniform maintenance of a bound (*).

The Fourier transforms of these function-spaces are next computed $(p'-p/(p-1)): \bar{S}=S; \bar{K}_p=Z^{p'}; \bar{Z}^{p_{12}}K_{p'}; \bar{K}=Z^{1}; \bar{Z}^{1}=K; \bar{Z}_p^{p_{12}}Z_{p'}$. A detailed discussion of Fourier transforms of generalized functions for each of the function spaces is given.

The applications to Cauchy's problem follow the usual procedure. Let $u(x, t) = \{u_1(x, t), \dots, u_n(x, t)\}$ be a vector function of $x = \{x_1, \dots, x_N\}$ and the real variable t. Consider. the system of differential equations

(1)
$$\frac{\partial u(x,t)}{\partial t} = P\left(\frac{1}{2\pi i} \frac{\partial}{\partial x}, t\right) u(x,t),$$

where P is an m1-matrix whose elements are linear differential operators of various orders multiplied by continuous functions of t. The initial condition is $u(x, 0) = u_0(x)$. This system may be regarded as a system of equations in generalized vector-functions $T(\varphi) = \{T_1(\varphi), \dots, T_n(\varphi)\}$, the unknown function u being replaced by an unknown generalized (CON T)